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heuristics



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On this page:

[Dictionary](#)

heuristic

Or did you mean: [heuristic](#) (computer science)

## Dictionary

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heu·ris·tic (hy-ris'tik)

*adj.*

1. Of or relating to a usually speculative formulation serving as a guide in the investigation or solution of a problem: *"The historian discovers the past by the judicious use of such a heuristic device as the 'ideal type'"* (Karl J. Weintraub).
2. Of or constituting an educational method in which learning takes place through discoveries that result from investigations made by the student.
3. *Computer Science.* Relating to or using a problem-solving technique in which the most appropriate solution of several found by alternative methods is selected at successive stages of a program for use in the next step of the program.

*n.*

1. A heuristic method or process.
2. *heuristics (used with a sing. verb)* The study and application of heuristic methods and processes.

[From Greek *heuriskein*, to find.]

heu·ris'ti·cal·ly *adv.*

## Technology



Computer Desktop Encyclopedia

heuristic

A method of problem solving using exploration and trial and error methods. Heuristic program design provides a framework for solving the problem in contrast with a fixed set of rules (algorithmic) that cannot vary.

## Obscure



heuristic

of or relating to exploratory problem-solving methods that utilize self-educating techniques to improve performance



## WordNet

*Note: click on a word meaning below to see its connections and related words.*

The *noun* heuristic has one meaning:

**Meaning #1:** a commonsense rule (or set of rules) intended to increase the probability of solving some problem

Synonyms: heuristic rule, heuristic program

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The *adjective* heuristic has 2 meanings:

**Meaning #1:** (computer science) relating to or using a heuristic rule

Pertains to noun: heuristic (meaning #1)

**Meaning #2:** of or relating to a general formulation that serves to guide investigation

Antonym: algorithmic (meaning #1)

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## Wikipedia



heuristic

*For heuristics in computer science, see heuristic (computer science)*

**Heuristic** is the art and science of discovery and invention. The word comes from the same Greek root as "eureka": εὑρίσκω, which means "I find". A heuristic is a way of directing your attention fruitfully.

The mathematician George Polya popularized heuristic in the twentieth century in his book *How to Solve It*. He learned mathematical proofs as a student, but didn't know how mathematicians think of proofs, nor was this taught. *How to Solve It* is a collection of ideas about heuristic that he taught to math students: ways of looking at problems and casting about for solutions.

Some commonplace heuristics, all from *How to Solve It*:

- If you are having difficulty understanding a problem, try drawing a picture.
- If you can't find a solution, try assuming that you have a solution and seeing what you can derive from that ("working backward").
- If the problem is abstract, try examining a concrete example.
- Try solving a more general problem first (the "inventor's paradox": the more ambitious plan may have more chances of success).

*Grammatical note:* The name of the topic is *heuristic* (not "heuristics"), a particular technique of directing your attention toward discovery is a *heuristic*, two or more of these are *heuristics*, and the adjective for "pertaining to how something is discovered" is *heuristic*.

## Psychology

In psychology, **heuristics** are simple, efficient rules of thumb which have been proposed to explain how people make decisions, come to judgments and solve problems, typically when facing complex problems or incomplete information. These rules work well under most circumstances, but in certain cases lead to systematic cognitive biases.

For instance, people may tend to perceive more expensive beers as tasting better than inexpensive ones. This finding holds true even when prices and brands are switched; putting the high price on the normally relatively inexpensive brand is enough to lead experimental participants to perceive that beer as tasting better than the beer that is normally relatively expensive. One might call this "price implies quality" bias.

Much of the work of discovering heuristics in human decision makers was ignited by Amos Tversky and Daniel Kahneman, who shared an important influence on behavioral finance. Critics led by Gerd Gigerenzer focus on how heuristics can be used to make principally accurate judgments rather than producing cognitive biases — heuristics that are "fast and frugal".

### Theorized psychological heuristics

#### *Well-known:*

- Anchoring and adjustment
- Availability heuristic
- Representativeness heuristic

#### *Lesser-known:*

- Affect heuristic
- Contagion heuristic
- Effort heuristic
- Familiarity heuristic
- Fluency heuristic
- Peak-end rule
- Recognition heuristic
- Scarcity heuristic
- Similarity heuristic
- Simulation heuristic
- Social proof

### Philosophy

In philosophy, especially in its Continental European kind, the adjective "heuristic" (or the designation "heuristic device") is used when an entity X is there to understand or to find out about some other entity Y, with which X is not identical. A good example is a model, which, as it is never identical with whatever it models, is a heuristic device to understand the latter. Stories, metaphors, etc., can also be termed heuristics in that sense. A classic example is the notion of utopia as described in Plato's best-known work, Politeia. This means that the purpose of the "ideal city" as depicted in the Politeia is not to be pursued or to present an orientation-point for development, but rather, that it shows how things would have to be connected, and how one thing would lead to another - often with highly problematic results, if one would opt for certain principles and carry them through rigorously.

### Law

In legal theory, especially that of law and economics, heuristics are used in the law when case-by-case analysis would be impractical.

For instance, in the United States the legal drinking age is 21, because it is argued that people need to be mature enough to make decisions involving the risks of alcohol consumption. However, assuming people mature at different rates, the specific age of 21 would be too late for some and too early for others. In this case, the somewhat arbitrary deadline is used because it is impossible or impractical to tell whether one individual is mature enough that society can trust them with that kind of responsibility.

The same reasoning applies to patent law. Patents are justified on the grounds that inventors need to be protected in order to have incentive to invent (or else suffer the tragedy of the commons if anyone could use their idea). So, it is argued that it is in the best interest of society to issue inventors a temporary government-granted monopoly on their product so they can

recoup their investment costs and make economic profit for a limited period of time. In the United States the length of this temporary monopoly is 20 years from the date the application for patent was filed, though the monopoly does not actually begin until the application has matured into a patent. However, like the drinking age problem above, the specific length of time would need to be different for every product in order to be efficient, but the 20-year number is used because it is difficult to tell what the number should be for any individual patent. More recently, some including [Lawrence Lessig](#) have argued that patents in different kinds of industries such as [software patents](#) should be protected for different lengths of time.

## Computer science

Main article [Heuristic \(computer science\)](#)

In [computer science](#), a **heuristic** is a technique designed to solve a problem that ignores whether the solution can be proven to be correct, but which usually produces a good solution or solves a simpler problem that contains or intersects with the solution of the more complex problem.

Heuristics are intended to gain computational performance or conceptual simplicity potentially at the cost of [accuracy or precision](#).

## Human-computer interaction

In [human-computer interaction](#), **heuristic evaluation** is a [usability testing](#) technique devised by usability consultant [Jakob Nielsen](#). In heuristic evaluation, the [user interface](#) is reviewed by experts and it's compliance to ten *usability heuristics* (broadly stated characteristics of a good user interface) is assessed and any violating aspects are recorded.

## See also

- [Behavioral economics](#) — an economic subfield with heuristics as one of its main arguments
- [Problem solving](#)

## External links

- [The Heuristic Wiki](#)

## Further reading

- *How To Solve It: A New Aspect of Mathematical Method*, George Polya, Princeton University Press, 1945,1957,1973. ISBN 0-691-02356-5 ISBN 0-691-08097-6
- *Judgement under Uncertainty: Heuristics & Biases*, ed. Daniel Kahneman, Amos Tversky and Paul Slovic, Cambridge University Press, 1982, ISBN 0521284147
- *Artificial Intelligence: A Modern Approach*, Stuart Russell and Peter Norvig, [1], Prentice Hall, 2nd ed., 2002. ISBN 0137903952

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## Translations

### Translations for: Heuristic

Nederlands (Dutch)

methodische studieleer, methode van vallen en opstaan (computer), door methodische studieleer (be)geleid



Français (French)  
heuristique

Deutsch (German)  
n. - heuristische Methode  
adj. - heuristisch

Ελληνική (Greek)  
n. ευρετική (μέθοδος αυτοδιδασχής) adj. διερευνητικός, βολιδοσκοπικός

Italiano (Italian)  
euristico

Português (Portuguese)  
n. - heurística (f)  
adj. - heurístico

Русский (Russian)  
эвристический

Español (Spanish)  
adj. - heurístico  
n. - método heurístico

Svenska (Swedish)  
n. - (pl.) heuristik (läran om metoderna att finna nya vetenskapliga resultat)  
adj. - heuristisk (logik. el. ped.)

中国话 (Simplified Chinese)  
adj. - 启发式的, 尝试错误的, 探索的  
n. - 启发式教育法

中國話 (Traditional Chinese)  
adj. - 啟發式的, 嘗試錯誤的, 探索的  
n. - 啟發式教育法

日本語 (Japanese)  
adj. - 自分で発見させる, 発見に役立つ

العربية (Arabic)  
(الاسم) الموجه أو المساعد على الكشف, المشجع للطالب على اكتشاف الأشياء بنفسه (صفة) موجه أو مساعد على الكشف, مشجع للطالب على اكتشاف الأشياء بنفسه

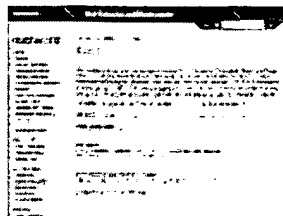
עברית (Hebrew)  
adj. - מסייע במציאת פתרון, מדע ההליכים ההיוריסטיים, הליך היוריסטי, (מחשבים) מתקדם לקראת פתרון ע"י ניסוי וטעייה - n. מדע ההליכים ההיוריסטיים, הליך היוריסטי -

If you are unable to view some languages clearly, click [here](#).

To select your translation preferences click [here](#).

## Best of the Web

Some good "heuristic" pages on the web:



[Math](#)  
mathworld.wolfram.com

## Mentioned In

*heuristics* is mentioned in the following topics:

[expert system](#)

[Gerd Gigerenzer](#)

[heuristic evaluation](#)

[Paul Slovic](#)

[Anti-Trojan software](#)

[Eurisko](#)

[sentence extraction](#)

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[Constraint satisfaction problem](#)

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
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Derwent World Patents Index  
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L2

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L2   L1 AND ((Abstract ADJ syntax ADJ tree) OR (AST))

2   L2

L1   software AND (reverse ADJ engineering)

661   L1

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